

### **REMARKS**

Applicant respectfully requests reconsideration of the application in light of the comments provided herein. Claims 1-29 are pending in this application. Claims 19, 23, and 26 have been amended. No claims have been added or canceled. Upon entry of the above-referenced amendments, Claims 1-29 are presented for further examination.

#### Discussion of Claim Rejections Under 35 U.S.C. § 112, ¶ 2

Claim 23 stands rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. According to the Examiner, the phrase "in said region" lacks antecedent basis. Claim 23 has been amended to remove this phrase, and Applicant respectfully submits that Claim 23 now meets the requirements of section 112.

#### Discussion of Claim Rejections Under 35 U.S.C. § 102(a)

Claims 1, 2, and 11 stand rejected under 35 U.C.S. 102(a) as being anticipated by Spartiotis et al. (US 2003/0155516). As an initial matter, Applicant respectfully submits that Spartioitis does not qualify as prior art under 35 U.S.C. § 102(a) because it was not published earlier than Applicant's priority date of October 23, 2002 (acknowledged by the Examiner in the Office Action), and that this rejection should be withdrawn on that basis alone. With respect to the specific rejections the Examiner states that Spartiotis discloses each limitation of independent Claims 1 and 11. Claim 1 recites:

A semiconductor circuit substrate for use in a radiation detection device, ... the semiconductor circuit substrate comprising:

a plurality of cell circuit contacts, each of which is configured to receive charge from a corresponding detector cell contact,

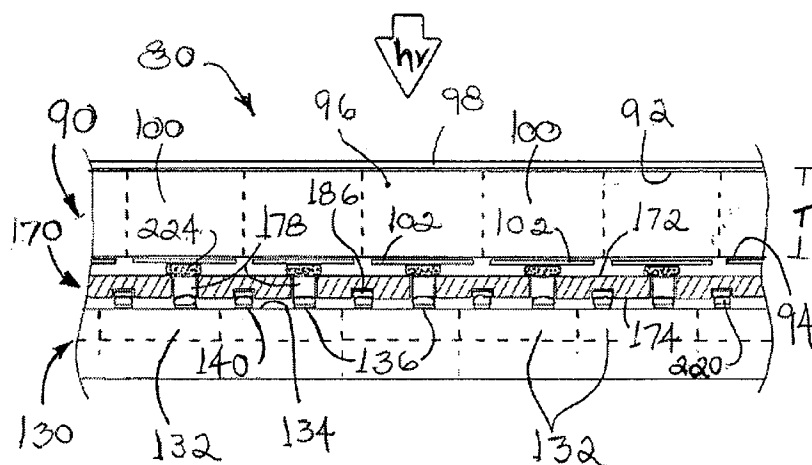
cell circuitry associated with said plurality of cell circuit contacts;

one or more conductive pathways arranged to carry at least one of control, readout and power supply signals to and/or from said cell circuitry; and

one or more signal pathways extending through said semiconductor circuit substrate, said one or more signal pathways being electrically coupled to said conductive pathways so as to provide an external signal interface for said cell circuitry.

Claim 11 recites substantially similar features. Applicant respectfully submits that Spartiotis does not disclose each and every feature arranged as in the claim as required by 35 U.S.C. § 102. *See, e.g., Net MoneyIn, Inc. v. Verisign, Inc.*, 545 F.3d 1359 (Fed. Cir. 2008) (“in order to anticipate under 35 U.S.C. § 102—must not only disclose all elements of the claim within the four corners of the document, but must also disclose those elements “arranged as in the claim”) (internal citation omitted).

The Examiner states that Spartiotis describes “cell circuitry 132 associated with the plurality of cell circuit contacts 224” and “signal pathways 178 extending through the semiconductor circuit substrate 170.” However, Applicant respectfully submits that the circuitry (132) of Spartiotis is not located in a substrate that also includes the signal pathways (178). As illustrated in Spartiotis Figure 6A (provided below), circuitry (132) is found in the readout substrate (130), while the signal pathways (178) are found in intermediate substrate (170).



Further, the intermediate substrate shown in Spartiotis does not show any conductive pathways coupled to the signal pathways. Thus, the elements cited by the Examiner are dispersed among several different substrates and do not combine to provide an external interface for cell circuitry. As a result, Spartiotis does not disclose each and every claim element “arranged as in the claim” and cannot anticipate Claim 1. Claim 2 depends from Claim 1. Accordingly, Applicant respectfully requests withdrawal of the rejections of Claims 1, 2, and 11 under 35 U.S.C. § 102(a).

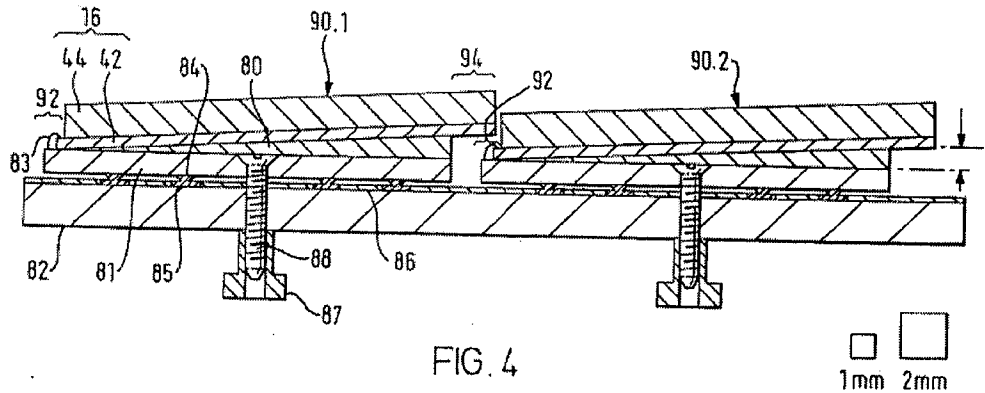
Discussion of Claim Rejections Under 35 U.S.C. § 103(a)

Claims 1, 2, 5, 8-14, 16-19, 24 and 25 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Kyyhkynen (US 2002/0130266) in view of Spartiotis. Claims 3, 4, 20 and 21 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Kyyhkynen, in view of Spartiotis and Iwaki (US 2002/0180063). The Examiner further rejects Claims 6 and 7 under 35 U.S.C. 103(a) as being unpatentable over Kyyhkynen, in view of Spartiotis and Stratton et al. (US 6,952,042). Claim 15 stands rejected under Kyyhkynen in view of Spartiotis and Shahar (US 2002/0036269). Claim 13 stands rejected under Kyyhkynen in view of Spartiotis and Cho (US 5,937,326), and Claims 26 and 27 stand rejected under Spartiotis in view of Cho. Claim 28 stands rejected under Spartiotis in view of Cho and Shahar. Claim 29 stands rejected under Spartiotis in view of Cho, Shahar, and Nemirovsky (US 6,645,787).

**Discussion of Independent Claims 1 and 11**

In rejecting Claim 1 as being obvious over Kyyhkynen in view of Spartiotis, the Examiner states that Kyyhkynen discloses the elements of Claim 1, but concedes that it lacks the feature of “a signal pathway extending through a semiconductor substrate.” See Office Action at 4. In order to cure this deficiency, the Examiner relies on Spartiotis, stating that it discloses this feature in Figure 6A and paragraphs 0051 and 0057. According to the Examiner, it would have been obvious to “provide the signal pathway of Kyyhkynen with as a via hole through the readout substrate, as taught by Spartiotis, in order to minimize dead area due to wire bonding in an x-ray detector tile.”

As discussed above, Claims 1 and 11 recite “a semiconductor circuit substrate comprising ... one or more signal pathways extending through said semiconductor circuit substrate.”



Kyyhkynen Figure 4 clearly shows that the wire connections (83) do not extend through the semiconductor circuit substrate. Rather, the connections (83) extend outside and around the circuit substrate as was described in the background section of the present application.

As discussed above, this feature is also not disclosed in Spartiotis. Accordingly, even if Spartiotis and Kyyhkynen were properly combinable, the proposed combination fails to teach or otherwise suggest at least the feature of “a semiconductor circuit substrate comprising ... one or more signal pathways extending through said semiconductor circuit substrate.” None of the remaining references, alone or in combination, cure this deficiency. Accordingly, the proposed combination cannot render Claims 1 and 11 obvious and Applicant respectfully requests withdrawal of the rejection.

### Discussion of Independent Claim 19

Claim 19 has been amended to recite “said semiconductor circuit substrate comprising cell circuitry.” Claim 19 also recites “forming one or more via holes through the semiconductor circuit substrate.” As discussed above, neither Kyyhkynen nor Spartiotis disclose a semiconductor circuit substrate comprising both circuitry and one or more signal pathways extending through the substrate. Thus, Applicant respectfully requests withdrawal of the rejection.

### **Discussion of Independent Claims 26**

Claim 26 been amended to recite “said semiconductor imaging device comprising a semiconductor circuit substrate comprising cell circuitry.” Claim 26 also recites “etching an array of via holes through the semiconductor circuit substrate.” As discussed above, Spartiotis does not disclose a semiconductor circuit substrate comprising both circuitry and one or more signal pathways extending through the substrate. Cho similarly fails to disclose a semiconductor circuit substrate comprising both circuitry and one or more signal pathways extending through the substrate. Thus, Applicant requests withdrawal of the rejection.

### **Spartiotis and Kyyhkynen Are Not Properly Combinable**

Each of the obviousness rejections rely at least in part on a combination of Kyyhkynen and Spartiotis. As noted above, the Examiner states that Kyyhkynen is properly combinable with Spartiotis because would have been obvious to “provide the signal pathway of Kyyhkynen as a via hole through the readout substrate, as taught by Spartiotis, in order to minimize dead area due to wire bonding in an x-ray detector tile.” Under MPEP 2143.01, if a proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. MPEP 2143.01; *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959). Moreover, a proposed combination is not proper where the “suggested combination of references would require a substantial reconstruction and redesign of the elements shown in [the primary reference] as well as a change in the basic principle under which the [primary reference] construction was designed to operate.” *Id.*

Applicant respectfully submits that combining the Kyyhkynen with Spartiotis would change the principle of operation of Kyyhkynen and also would require a substantial reconstruction and redesign in order to incorporate Spartiotis’s teachings in the manner proposed by the Examiner.

The device disclosed in Kyyhkynen is designed not to reduce or minimize dead area on substrates, but rather seeks to compensate for that dead area by providing an active area of one substrate tile which overlaps an inactive area of another adjacent tile. Modifying Kyyhkynen

with Spartioitis as proposed by the Examiner would radically change this approach by not compensating for the dead area, but rather eliminating it entirely. Thus, the principle of operation of Kyyhkynen would need to be changed in order to incorporate the teachings of Spartioitis.

Applicant further submits that Kyyhkynen would require a substantial reconstruction and redesign in order to combine the teachings of Spartioitis to achieve the claimed invention. For example, the via holes in Spartioitis (which are present in an intermediate substrate) would need to be relocated into an entirely different substrate (a semiconductor readout substrate) in the Kyyhkynen device. Moreover, the readout substrate provided by Kyyhkynen would also need to be modified to include conductive pathways that are electrically coupled to signal pathways, as such a modification would be required to carry signals to and/or from the cell circuitry of the readout substrate. The Examiner's proposed combination would also require a substantial modification in the way that signals are routed to and from cell circuitry. In Kyyhkynen, the external wires located in the inactive region (92) of the tiles would need to be removed, and the pathways in the tile would need to be reconfigured to pass signals from cell circuitry through the via holes.

Because the proposed modification would both require a substantial redesign of Kyyhkynen and change its principle of operation, the proposed modification of Kyyhkynen with the teachings of Spartioitis is improper, and a prima facie case of obviousness cannot be set forth using the proposed combination. Because each of the obviousness rejections relies on this proposed combination, Applicant respectfully submits that each obviousness rejection should be withdrawn.

#### Discussion of Dependent Claims

The dependent Claims incorporate by reference all the limitations of independent Claims 1, 11, 19 and 26, respectively, pursuant to 35 U.S.C. § 112, ¶ 4. In view of the limitations as recited in independent claims, and in view of the additional limitations as recited in dependent claims, Applicant respectfully submits that Kyyhkynen, Spartiotis, Stratton, Shahar, Cho, or Nemirovsky, either alone or in combination, fail to disclose or suggest all limitations of dependent claims. Furthermore, Applicant does not necessarily agree with the characterizations

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and assessments made by the Examiner with respect to the independent claims. Thus, Applicant respectfully submits that all dependent claims are allowable over Kyyhkynen, Spartiotis, Stratton, Shahar, Cho, and Nemirovsky, either alone or in combination.

No Disclaimers or Disavowals

Although the present communication may include alterations to the application or claims, or characterizations of claim scope or referenced art, Applicant is not conceding in this application that previously pending claims are not patentable over the cited references. Rather, any alterations or characterizations are being made to facilitate expeditious prosecution of this application. Applicant reserves the right to pursue at a later date any previously pending or other broader or narrower claims that capture any subject matter supported by the present disclosure, including subject matter found to be specifically disclaimed herein or by any prior prosecution. Accordingly, reviewers of this or any parent, child or related prosecution history shall not reasonably infer that Applicant has made any disclaimers or disavowals of any subject matter supported by the present application.

CONCLUSION

In view of the above, Applicant respectfully submits that the application is in condition for allowance, for which early action is requested.

Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

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Dated: October 14, 2009

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AMEND

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